

## REMARKS

### I. Status of the Application

Claims 1-5 are pending in this application, and new claims 6-8 are added. Claims 1 and 4 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Bregoli et al., U.S. Patent No. 5,468,573. Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bregoli et al. Claims 3 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bregoli et al. in view of Okabe et al., JP 57-80675.

Applicants have amended certain of the claims and added new claims to more clearly define and distinctly characterize Applicants' novel invention. Claims 1 and 4 have been amended to correct minor grammatical errors and to properly identify antecedent basis, as well as to define the slurry as an aqueous-based slurry. Claim 5 has been amended to put it into present tense. Support for the amendments and for the new claims can be found in the specification and the claims as originally filed. Support for the amendments to claims 1 and 4 can be found in the specification at least at page 3, line 7-10, and page 4, lines 15-20. Further support for the amendments to claim 4 can be found in the specification at least at page 1, lines 16-19, page 5, lines 1-19, and claim 1. Support for the amendment to claim 5 is found in claim 3. New claim 6 is supported at least at page 5, line 14-16. New claims 7 and 8 are supported at least at page 1, lines 20-21. Applicants respectfully submit that the amendments and new claim presented herein add no new matter.

Applicants respectfully request entry and consideration of the foregoing amendments, which are intended to place this case in condition for allowance.

## **II. The Claims Are Novel Over Bregoli et al.**

Claims 1 and 4 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Bregoli et al., U.S. Patent No. 5,468,573. Applicants respectfully traverse this rejection based on the claims as amended.

Bregoli et al. disclose an electrolyte paste for use in molten carbonate fuel cells that uses thin anode plates. Bregoli et al. apply carbonate electrolyte to the plates utilizing a carrier, assemble the fuel cell, and then heat the fuel cell stack up to operating temperature to vaporize or chemically decompose the carrier. Col. 2, lines 1-20. Thus, as can be seen, Bregoli et al. does not disclose applying an electrolyte slurry, drying the slurry to remove the carrier, and then assembling the stack as is required in claim 1. Further, Bregoli et al. fail to disclose an aqueous-based slurry as required by each of claims 1 and 4.

As Bregoli et al. fail to teach all of Applicants' claim limitations, Applicants respectfully request that the rejection of claims 1 and 4 under 35 U.S.C. § 102(b) be reconsidered and withdrawn and that claims 6-8 likewise be allowed over Bregoli et al.

## **III. The Claims Are Non-Obvious Over Bregoli et al.**

Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bregoli et al. Applicants respectfully traverse this rejection.

As noted above, Bregoli et al. fail to disclose a method of providing a supply of electrolyte to a molten carbonate fuel cell in which the electrolyte slurry carrier is dried to remove the carrier prior to assembling the stack, and fails to disclose an aqueous-based slurry, each of which is required by claim 1, from which claim 2 depends. As such, Bregoli et al. cannot render claim 2 obvious. To establish a *prima facie* case of obviousness, the references

when combined must teach or suggest all of the claim limitations. MPEP 2143. Thus, claim 2 and new claims 6-8, are non-obvious over Bregoli et al., and Applicants request allowance of each of these claims on this basis.

Additionally, Bregoli et al., as noted by the Examiner, teach an electrolyte paste having a carrier present in an amount of about 30%. Bregoli et al. further note that the percentage of carrier is an important consideration in the Bregoli et al. invention. The Examiner cites to *In re Boesch*, 205 USPQ 215 (C.C.P.A. 1980), for the proposition that the “discovery of optimum value of result effective variable in known process is ordinarily within skill of art” (quoting the Examiner and not the case). *In re Boesch*, in actuality, stands for the proposition that, where the claimed range and the prior art range of a variable overlap, “a *prima facie* case of obviousness may be rebutted where the results of optimizing the variable, which was known to be result effective, are unexpectedly good.” *In re Boesch*, 215 USPQ at 219. To have the *prima facie* case of obviousness in the first instance, the claim and the prior art must have overlapping ranges. *See id* at 218 (“[e]ach of the ranges of constituents in applicants’ claimed alloys overlaps ranges disclosed by [the prior art]”); see also MPEP 2143 (“[t]o establish a *prima facie* case of obviousness...the prior art reference (or references when combined) must teach or suggest all of the claim limitations”). Optimization of a variable to a quantity falling outside of the range taught by the prior art is not *prima facie* obvious. Thus, the percentage of carrier in claim 2 is also not obvious over Bregoli et al.

As Bregoli et al. does not disclose, teach or suggest each and every limitation of claim 2, or of new claims 6-8, Applicants request that the rejection of claim 2 under 35 U.S.C. § 103(a) be withdrawn and that claims 2 and 6-8 be allowed over Bregoli et al.

**IV. The Claims Are Non-Obvious Over Bregoli et al. in View of Okabe et al.**

Claims 3 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bregoli et al. in view of Okabe et al., JP 57-80675. Applicant respectfully traverses this rejection.

To establish a *prima facie* case of obviousness, the Examiner must show (1) some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine the reference teachings; (2) a reasonable expectation of success; and (3) the references when combined must teach or suggest all of the claim limitations. MPEP 2143. As to the first of these, there are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In re Rouffet, 149 F.3d 1350, 1357 (Fed. Cir. 1998). Here, a *prima facie* case of obviousness cannot be established because there is no motivation to modify the Bregoli et al. fuel cell with the Okabe reference. The motivation suggested by the Examiner is to modify the Bregoli et al. reference “because Okabe et al. teach the use of a carbonate/water mixture to achieve desired capacity and mechanical strength in the resulting electrolyte.” Such mechanical strength and supporting capacity are not required by the Bregoli et al. fuel cell, however, as the electrolyte slurry is deposited directly into to cell hardware flow channels rather than being stored in the electrolyte matrix. In other words, the fuel cell stack of Bregoli et al. does not rely on or require the dried electrolyte to provide any support or to have a high degree of mechanical strength. Thus, one of skill in the art would not be motivated to modify Bregoli et al. with the Okabe et al. reference.

In fact, one of skill in the art would be instructed by Bregoli et al. to avoid combination with Okabe et al., as Bregoli et al. teach away from the use of an aqueous material in the carrier.

See col. 2, lines 35-40 of Bregoli et al. ("the carrier vehicle should not react with the electrolyte or other materials in the stack. Aqueous materials are thus not suitable for the aforesaid purpose."). If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900 (Fed. Cir. 1984). As the Examiner has failed to demonstrate a motivation to combine the references, a prima facie case of obviousness has not been made, and Applicants request the rejection based on 103(a) be withdrawn. Further, as Okabe et al. is not properly combinable with Bregoli et al., Applicants respectfully request allowance of new claims 6-8 over these combined references.

**V. CONCLUSION**

Reconsideration and allowance of all the pending claims is respectfully requested. If a telephone conversation with Applicants' attorney would expedite prosecution of the above-identified application, the Examiner is urged to call the undersigned at (617) 720-9600.

The Commissioner is hereby authorized to charge any additional fees or credit overpayment to Deposit Account No. 19-0733.

Respectfully submitted,

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